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10/572,894	03/20/2006	Ian David Stones	M03B354	1336

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Edwards Vacuum, Inc.
2041 MISSION COLLEGE BOULEVARD
SUITE 260
SANTA CLARA, CA 95054

EXAMINER	
BOBISH, CHRISTOPHER S	
ART UNIT	**PAPER NUMBER**
3746	

NOTIFICATION DATE	DELIVERY MODE
06/10/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

LORETTA.SANDOVAL@EDWARDSVACUUM.COM

Office Action Summary	Application No.	Applicant(s)	
	10/572,894	STONES ET AL.	
	Examiner	**Art Unit**	
	CHRISTOPHER BOBISH	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 January 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-59* is/are pending in the application.

4a) Of the above claim(s) *2,30,43 and 44* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-29, 31-42, 45-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *05/11/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendments filed on 01/21/2010 have been considered and are insufficient to overcome the Stones and Mase references.

Claims 2, 30 and 43-44 have been cancelled; claims 1, 3-29, 31-42 and 45-59 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 55-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stones (EP Patent Application No. 0 959 253 A2).

Stones teaches:

limitations from claim 55, an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an impeller),** for a vacuum pump, **FIG. 3 C. 1 Line 4**, the impeller having integral therewith a rotor element of a turbomolecular pumping stage, **C. 3 Lines 25-29, it can be seen from FIG. 3 that the rotor elements (54) are integral with impeller (52, 9)**, a plurality of rotor elements, **shown and labeled by examiner**

in the above drawing, extending from impeller (52, 9), of a regenerative pumping mechanism, **FIG. 3 (1)**, and a rotor**, FIG. 3 (9),** for receiving a rotor element, **FIG. 3 shown above and labeled by examiner shows a rotor element (cylinder) of a drag pumping mechanism attached to a rotor (9),** of a molecular drag pumping mechanism; in a manner that the rotor element of the molecular drag pumping mechanism is a piece of material mounted to a separate piece of material forming the rotor element of the turbomolecular pumping stage and the rotor elements of the regenerative pumping mechanism, **Stones further teaches in FIG. 1 that the cylinder of the drag section is also known to be a separate part from the rotor (see 9 and 26), one of ordinary skill would find it obvious to substitute one known coupling technique for another based on assembly requirements;**
;

limitations from claim 56, an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an impeller),** according to claim 55; wherein the rotor comprises a disc**, C. 3 Line 3**, substantially orthogonal to the longitudinal axis of the impeller, **the above labeled drawing shows a disc oriented orthogonal to the impellers longitudinal axis**;

limitations from claim 57, an impeller, wherein the rotor elements of the regenerative pumping mechanism comprise a series of blades positioned in an annular array on one side of the rotor, **shown and labeled in above drawing as regenerative rotor elements, C. 3 Lines 5-7 examiner considers “rings” to be equivalent to “blades”**;

limitations from claim 58, an impeller, wherein the rotor elements of the regenerative pumping mechanism comprise at least two series of blades, **shown and labeled in above drawing as regenerative rotor elements, C. 3 Line 5,** positioned in concentric annular arrays on said one said of the rotor, **FIG. 3 (9)**;

Stones does not teach a rotor receiving elements of both the molecular drag and regenerative sections on the same side. However;

limitations from claim 59, a pump, wherein the rotor is arranged to receive a rotor element of the molecular drag pumping mechanism on said one side of the rotor;

Stones teaches and discloses the claimed invention except for the rotor element of the molecular drag mechanism being located on the same side of a rotor as the elements of the regenerative mechanism; It would have been obvious to one having ordinary skill in the art at the time the invention was made to place the rotor element of the molecular drag mechanism on either side of the rotor in order to minimize the size of the pump through compact design, since it has been held that rearranging of parts of an invention involves only routine skill in the art. In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950); MPEP § 2144.04

Claims 1, 3-11, 13-17, 25, 26, 29, 31-38, 42, 45-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stones (EP Patent Application No. 0 959 253 A2) in view of Mase et al (US Patent No. 5,020,969).

Claim 1:

Stones teaches:

a vacuum pump, **FIG. 3 C. 1 Line 4**, comprising a molecular drag pumping mechanism, **FIG. 3 (2) C. 3 Line 43 (Holweck)**, and, downstream therefrom, a regenerative pumping mechanism, **FIG. 3 (1) C. 3 Line 45**; wherein the rotor element of the molecular drag pumping mechanism comprises a cylinder mounted for rotary movement with the rotor elements of the regenerative pumping mechanism, **FIG. 3 (1) C. 3 Line 45, FIG. 3 shown below and adapted by the examiner shows a cylinder of the molecular drag section (Holweck) attached to a rotor (9) of the regenerative section (1); Stones further teaches in FIG. 1 that the cylinder of the drag section is also known to be a separate part from the rotor (see 9 and 26), one of ordinary skill would find it obvious to substitute one known coupling technique for another based on assembly requirements;**

Stones does not teach a rotor surrounding the regenerative mechanism, but Mase does.

Mase teaches:

wherein a rotor element, **FIG. 11 (51A) C. 6 Line 59**, of the molecular drag pumping mechanism, **FIG. 11 (72) C. 6 Line 58**, surrounds rotor elements, **FIG. 3 (55A) C. 6 Line 64**, of the regenerative pumping mechanism, **FIG. 3 (55A, 57A) C. 6 Lines 64-68**;

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time the invention was made to locate the molecular drag pump mechanism and rotor element of Stones in the manner taught by Mase in order to further minimize pump size;

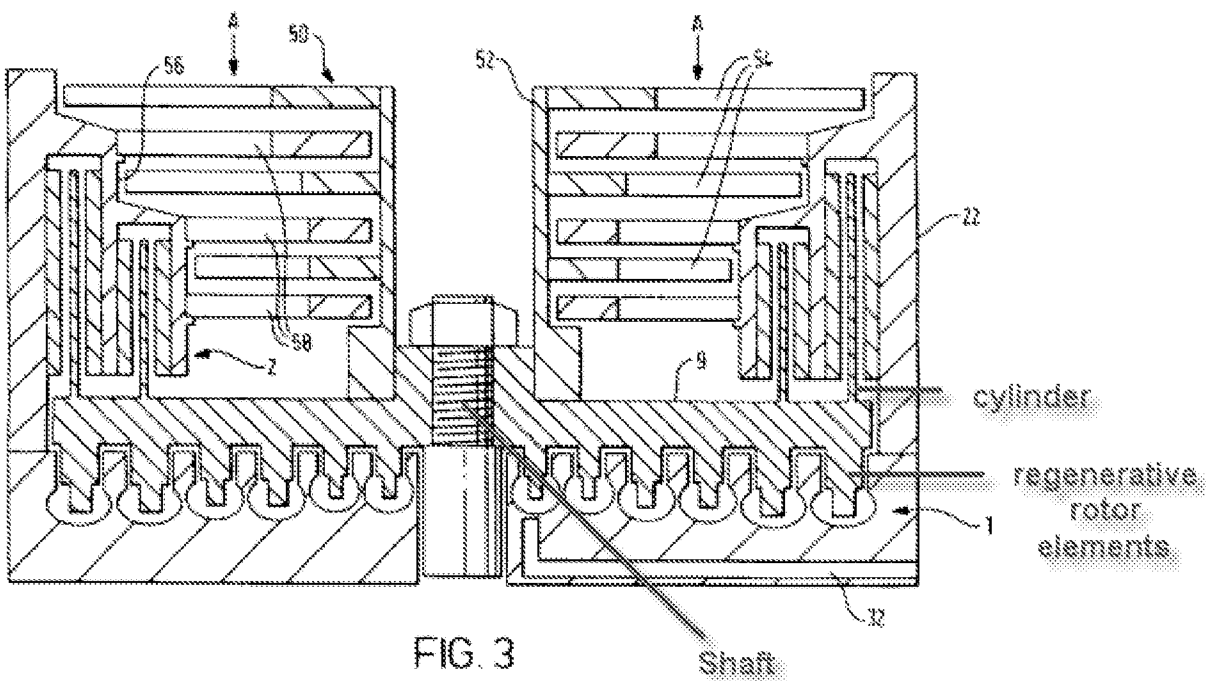


FIG. 3

limitations from claim 3, a pump; wherein the cylinder forms part of a multi-stage Holweck pumping mechanism, **FIG. 3 (2) C. 3 Line 43;**

limitations from claim 4, a pump, wherein the rotor element of the molecular drag pumping mechanism, **shown and labeled by examiner in the above drawing,** and the rotor elements, **shown and labeled by examiner in the above drawing**, of the regenerative pumping mechanism, **FIG. 3 (1) C. 3 Line 45,** are located on a common rotor, **FIG. 3 (9) C. 3 Line 24,** of the pump;

limitations from claim 5, a pump comprising an impeller, **FIG. 3 (52) C. 3 Line 25 (rotor body)**, mounted on a drive shaft of the pump, the rotor being integral with the impeller, **the impeller (52) is mounted on the rotor (9) which is mounted on a shaft** (**shown and labeled by examiner in the above drawing)**;

limitations from claim 6, a pump; wherein the rotor **(9)** comprises a disc**, C. 3 Line 3**, substantially orthogonal to the drive shaft;

limitations from claim 7, a pump, wherein the rotor elements of the regenerative pumping mechanism comprise a series of blades, **shown and labeled in above drawing as regenerative rotor elements, C. 3 Lines 5-7 examiner considers "rings" to be equivalent to "blades"**, positioned in an annular array on one side of the rotor;

limitations from claim 8, a pump; wherein the blades are integral with the rotor, **C. 3 Line 5, examiner considers "formed thereon" to constitute integral, it also can be seen in FIG. 3 that the elements are integral with rotor (9)**;

limitations from claim 10, a pump, wherein the regenerative pumping mechanism, **FIG. 3 (1)**, comprises at least two series of blades, **shown and labeled in above drawing as regenerative rotor elements, C. 3 Line 5,** positioned in concentric annular arrays on said one said of the rotor **FIG. 3 (9)**;

Stones does not teach a common stator for the regenerative and drag pumping mechanisms or a rotor surrounding the regenerative mechanism, but Mase does.

Mase teaches:

limitations from claim 11, a common stator, **FIG. 11 (56A) C. 6 Line 63,** for the regenerative pumping mechanism and at least part, **FIG. 11 shows stator (56A) as the bottom portion of molecular drag (Holweck) section (72), it is also noted by examiner that a spacer FIG. 11 (75) mounted with and extending from stator (56A) forms the side of molecular drag (Holweck) section (72),**

of the molecular drag pumping mechanism;

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time the invention was made to use a single stator as taught by Mase in the pump taught by Stones to minimize the parts and therefore size of the pump.

Stones and Mase teach and disclose the vacuum pump of claim 1.

Stones further teaches:

limitations from claim 13, a pump comprising an additional pumping mechanism, **FIG. 3 (50) C. 3 Lines 18-20,** upstream from the molecular drag stage, **FIG. 3 (2) C. 3 Line 43 (Holweck)**;

limitations from claim 14, a pump, wherein the additional pumping mechanism comprises at least one turbomolecular, **FIG. 3 (50) C. 3 Lines 18-20,** pumping stage;

limitations from claim 15, a pump comprising an additional pumping mechanism upstream, **FIG. 3 (50),** from the molecular drag stage, and wherein a rotor element, **FIG. 3 (54) C. 3 Lines 25-29,** of the additional pumping mechanism is located on the impeller, **FIG. 3 (52)**;

limitations from claim 16, a pump, wherein the rotor element of the additional pumping mechanism, **FIG. 3 (50),** is integral with the impeller, **C. 3 Lines 25-29, it can be seen from FIG. 3 that the elements (54) are integral with impeller (52);**

limitations from claim 17, a pump comprising a pump inlet, **FIG. 3 (A) C. 3 Lines 39-41,** located upstream from the additional pumping mechanism, **FIG. 3 (50),** and an outlet located downstream from the regenerative pumping mechanism, **FIG. 3 (32) C. 3 Lines 45-46**;

limitations from claim 25, a pump comprising an additional pumping mechanism, **FIG. 3 (50) C. 3 Lines 18-20,** upstream from the molecular drag stage, **FIG. 3 (2) C. 3 Line 43 (Holweck)**, and wherein a rotor element, **FIG. 3 (54) C. 3 Lines 25-29,** of the turbomolecular pumping mechanism is located on the impeller, **FIG. 3 (52);**

limitations from claim 26, a pump, wherein the rotor element of the additional pumping mechanism, **FIG. 3 (50),** is integral with the impeller, **C. 3 Lines 25-29, it can be seen from FIG. 3 that the elements (54) are integral with impeller (52);**.

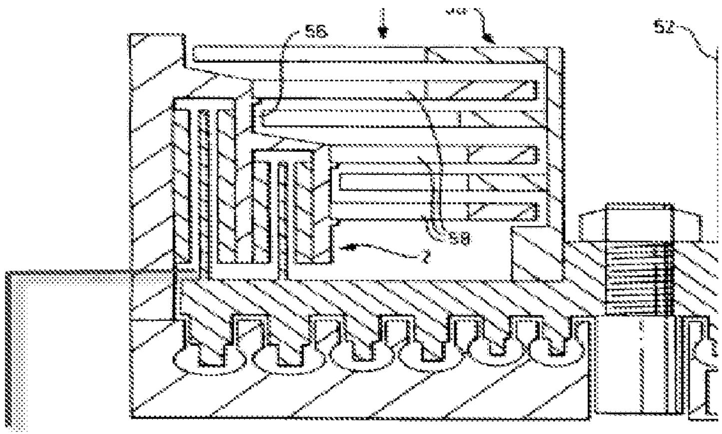
limitations from claim 29, an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an impeller),** for a vacuum pump, **FIG. 3 C. 1 Line 4**, the impeller comprising a rotor element, **FIG. 3 is shown below and is adapted to show the rotor element extending from impeller (52, 9),** of a molecular drag pumping mechanism, **FIG. 3 (2),** and a plurality of rotor elements, **shown and labeled by examiner in the above drawing, extending from impeller (52, 9)**, of a regenerative pumping mechanism, **FIG. 3 (1);** wherein the rotor element of the molecular drag pumping mechanism comprises a cylinder mounted for rotary movement with the rotor elements of the regenerative pumping mechanism, **FIG. 3 (1) C. 3 Line 45, FIG. 3 shown below and adapted by the examiner shows a cylinder of the molecular drag section (Holweck) attached to a rotor (9) of the regenerative section (1); Stones further teaches in FIG. 1 that the cylinder of the drag section is also known to be a separate part from the rotor (see 9 and 26), one of ordinary skill would find it obvious to substitute one known coupling technique for another based on assembly requirements;**

Stones does not teach a rotor surrounding the regenerative mechanism, but Mase does.

Mase teaches:

limitations from claim 29, wherein the rotor element, **FIG. 11 (51A) C. 6 Line 59**, of the molecular drag pumping mechanism, **FIG. 11 (72) C. 6 Line 58**, surrounds the rotor elements, **FIG. 3 (55A) C. 6 Line 64**, of the regenerative pumping mechanism, **FIG. 3 (55A, 57A) C. 6 Lines 64-68**;

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time the invention was made to locate the molecular drag pump mechanism and rotor element or Stones in the manner taught by Mase in order to further minimize pump size;



rotor element of molecular drag mechanism

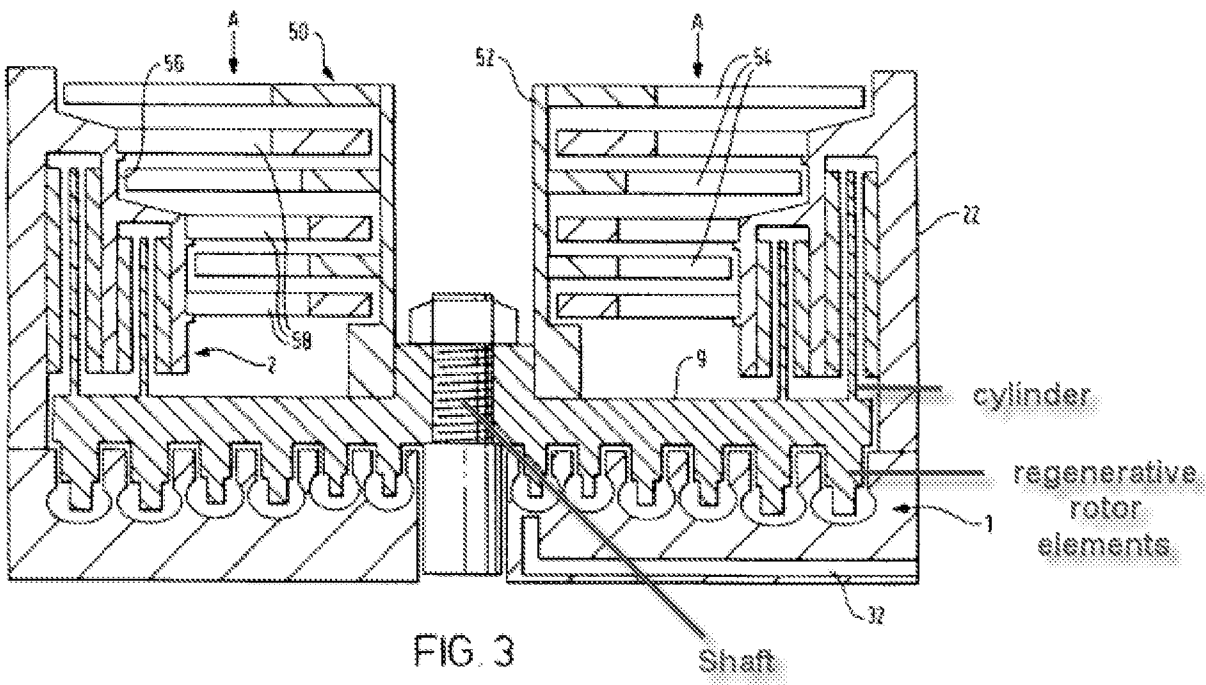


FIG. 3

limitations from claim 31, an impeller, wherein the cylinder forms part of a multi-stage Holweck pumping mechanism, **FIG. 3 (2) C. 3 Line 43;**

limitations from claim 32, an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an impeller),** wherein the rotor element of the molecular drag pumping mechanism, **shown and labeled by examiner in the above drawing (cylinder),** and the rotor elements, **shown and labeled by examiner in the above drawing,** of the regenerative pumping mechanism are located on a common rotor of the impeller, **FIG. 3 (9) C. 3 Line 24;**

limitations from claim 33, and impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an impeller), these parts appear integral together in the drawing above**; wherein the rotor is integral with the impeller;

limitations from claim 34, an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an impeller),** according to claim 33; wherein the rotor **(9)** comprises a disc**, C. 3**

Line 3, substantially orthogonal to the longitudinal axis of the impeller;

limitations from claim 35, an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an impeller),** according to claim 32, wherein the rotor elements of the regenerative pumping mechanism comprise a series of blades positioned in an annular array on one side of the rotor, **shown and labeled in above drawing as regenerative rotor elements, C. 3 Lines 5-7 examiner considers "rings" to be equivalent to "blades"**;

limitations from claim 36, an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an impeller),** according to claim 35; wherein the blades are integral with the rotor, **the impeller (52, 9) is mounted on the rotor (9) which is mounted on a shaft (shown and labeled by examiner in the above drawing);**

limitations from claim 38, an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an impeller),** according to claim 35, wherein the regenerative pumping mechanism comprises at least two series of blades, **shown and labeled in above drawing as regenerative rotor elements, C. 3 Line 5,** positioned in concentric annular arrays on said one said of the rotor, **FIG. 3 (9)**;

limitations from claim 42, a vacuum pump comprising a molecular drag pumping mechanism and a regenerative pumping mechanism, a drive shaft, (**shown and labeled by examiner in the above drawing),** having located thereon a rotor element for the molecular drag pumping mechanism and rotor elements for the regenerative pumping mechanism; **FIG. 3 shown below and adapted by the examiner shows a cylinder (rotor element) of the molecular drag section (Holweck) attached to a rotor (9) of the regenerative section (1) attached to a shaft shown below);** wherein the rotor element of the molecular drag pumping mechanism comprises a cylinder mounted for rotary movement with the rotor elements of the regenerative pumping mechanism, **FIG. 3 (1) C. 3 Line 45, FIG. 3 shown below and adapted by the examiner shows a cylinder of the molecular drag section (Holweck) attached to a rotor (9) of the regenerative section (1); Stones further teaches in FIG. 1 that the cylinder of the drag section is also known to be a separate part from the rotor (see 9 and 26), one of ordinary skill would find it obvious to substitute one known coupling technique for another based on assembly requirements;**

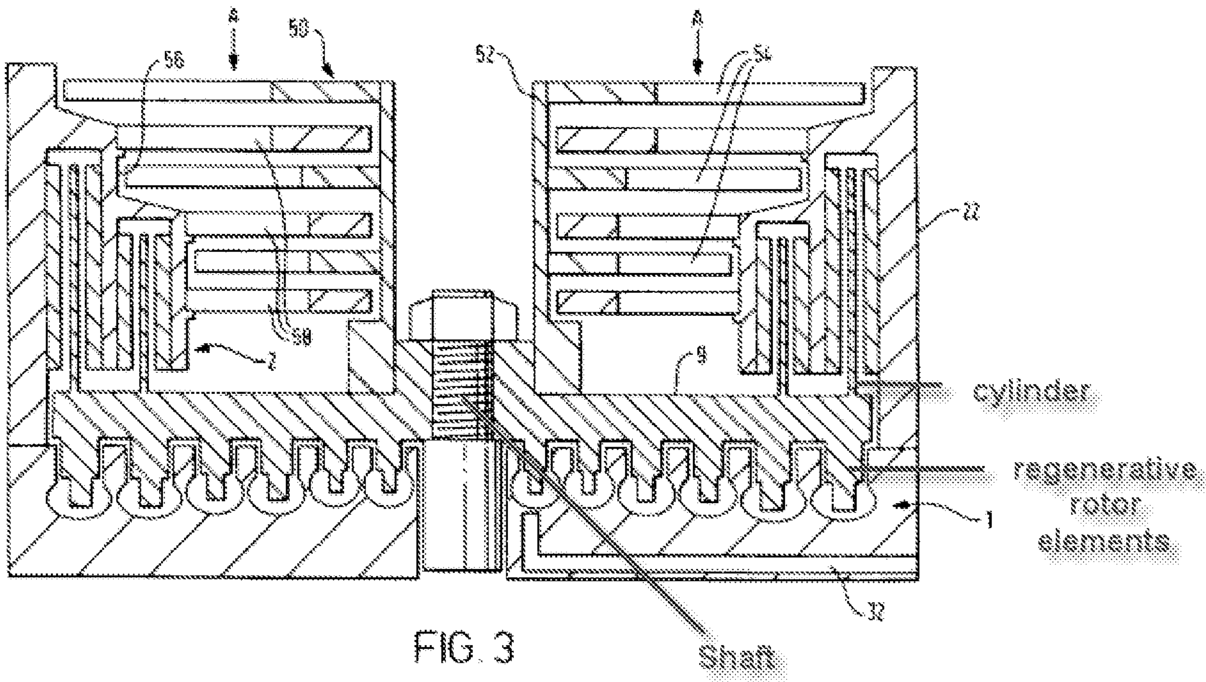


FIG. 3

Stones does not teach a rotor surrounding the regenerative mechanism, but Mase does.

Mase teaches:

limitations from claim 29, wherein the rotor element, **FIG. 11 (51A) C. 6 Line 59**, of the molecular drag pumping mechanism, **FIG. 11 (72) C. 6 Line 58**, surrounds the rotor elements, **FIG. 3 (55A) C. 6 Line 64**, of the regenerative pumping mechanism, **FIG. 3 (55A, 57A) C. 6 Lines 64-68**;

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time the invention was made to locate the molecular drag pump mechanism and rotor element or Stones in the manner taught by Mase in order to further minimize pump size;

Stones does not teach a common stator for the regenerative and drag pumping mechanisms or a rotor surrounding the regenerative mechanism, but Mase does.

Mase teaches:

a common stator, **FIG. 11 (56A) C. 6 Line 63,** for both the regenerative pumping mechanism and at least part, **FIG. 11 shows stator (56A) as the bottom portion of molecular drag (Holweck) section (72), it is also noted by examiner that a spacer FIG. 11 (75) mounted with and extending from stator (56A) forms the side of molecular drag (Holweck) section (72),** of the molecular drag pumping mechanism;

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time the invention was made to use a single stator as taught by Mase in the pump taught by Stones to minimize parts and therefore size of the pump.

Stones and Mase teach and disclose the vacuum pump of claim 42.

Stones further teaches:

limitations from claim 45, a pump, wherein the cylinder forms part of a multi-stage Holweck pumping mechanism, **FIG. 3 (2) C. 3 Line 43;**

limitations from claim 46, a pump, wherein the rotor element of the molecular drag pumping mechanism, **shown and labeled by examiner in the above drawing (cylinder),** and the rotor elements, **shown and labeled by examiner in the above drawing,** of the regenerative pumping mechanism are located on a common rotor, **FIG. 3 (9),** of the pump.

limitations from claim 47, a pump comprising an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body and rotor is considered by examiner to comprise an impeller)**, mounted on the drive shaft, **shown and labeled by examiner in the above drawing**, and wherein the rotor is integral with the impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body and rotor are considered by examiner to comprise an impeller), these parts appear integrally connected**;

limitations from claim 48, a pump, wherein the rotor, **FIG. 3 (9),** comprises a disc, **C. 3 Line 3**, substantially orthogonal to the drive shaft, **shown in above drawing**;

limitations from claim 49, a pump, wherein the rotor elements of the regenerative pumping mechanism comprise a series of blades positioned in an annular array on one side of the rotor, **shown and labeled in above drawing as regenerative rotor elements, C. 3 Lines 5-7 examiner considers “rings” to be equivalent**

to "blades";

limitations from claim 50, a pump, wherein the blades are integral with the rotor, **C. 3 Line 5, examiner considers "formed thereon" to constitute integral, it also can be seen in FIG. 3 that the elements are integral with rotor (9)**;

limitations from claim 52, a pump, wherein the regenerative pumping mechanism comprises at least two series of blades, **shown and labeled in above drawing as regenerative rotor elements, C. 3 Line 5,** positioned in concentric annular arrays on said one said of the rotor, **FIG. 3 (9)**;

Stones does not teach a stator with channels, but Mase does.

Mase teaches:

limitations from claim 52, a stator, **FIG. 11 (56A) C. 6 Line 63,** comprises a corresponding number of channels, **FIG. 11 (57A) C. 6 Line 67,** within which the blades, **FIG. 11 (55A) C. 6 Line 66**, can rotate;

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time the invention was made to use a single stator as taught by Mase for creating channels in the pump taught by Stones to minimize parts and therefore size of the pump.

Stones and Mase disclose and teach of a pump of claims 7, 35 and 49.

limitations from claim 9, a pump, wherein the rotor element of the molecular drag pumping mechanism is mounted on said one side of the rotor;

limitations from claim 37, a pump, wherein the rotor element of the molecular drag pumping mechanism is mounted on said one side of the rotor;

limitations from claim 51, a pump, wherein the rotor element of the molecular drag pumping mechanism is mounted on said one side of the rotor;

Regarding claims 9, 37, 51;

Stones and Mase disclose the claimed invention except for the rotor element of the molecular drag mechanism being located on the same side

of a rotor as the elements of the regenerative mechanism; It would have been obvious to one having ordinary skill in the art at the time the invention was made to place the rotor element of the molecular drag mechanism on either side of the rotor in order to minimize the size of the pump through compact design, since it has been held that rearranging of parts of an invention involves only routine skill in the art. In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950); MPEP § 2144.04

Claims 12, 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stones (EP Patent Application No. 0 959 253 A2) in view of Mase et al (US Patent No. 5,020,969) as applied to claims 1, 3-11, 13-17, 25, 26, 29, 31-38, 42, 45-52, and in further view of Schutz et al (US Patent No. 5,695,316).

Claim 12:

Stones teaches:

a pump, **FIG. 3 C. 1 Line 4**, according to claim 1, further comprising a pumping mechanism, **FIG. 3 (1) C. 3 Line 45;**

Stones does not teach a rotor surrounding the regenerative mechanism, but Mase does.

Mase teaches:

a rotor element, **FIG. 11 (51A) C. 6 Line 59**, of the molecular drag pumping mechanism, **FIG. 11 (72) C. 6 Line 58**, surrounding the rotor elements, **FIG. 3 (55A) C. 6 Line 64**, of the pumping mechanism.

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time the invention was made to locate the molecular drag pump mechanism and rotor element or Stones in the manner taught by Mase in order to further minimize pump size.

Neither Stones nor Mase teach that the pumping mechanism is a Gaede pumping mechanism, but Schutz does.

Schutz teaches:

a pump, FIG. 9 C. 4 Line 44, with a Holweck section, FIG. 9 (55, 56, 57) C. 4 Line 53, followed by a Gaede pumping section, FIG. 9 (60-68) C. 4 Lines 57-67;

Stones and Mase disclose limitations of claim 42, but neither Stones nor Mase teach that the pumping mechanism is a Gaede pumping mechanism, but Schutz does.

limitations from claim 53, a pump, further comprising a Gaede pumping mechanism**, FIG. 9 (60-68) C. 4 Lines 57-67,** having a plurality of rotor elements, **C. 4 Line 64,** positioned in an annular array, the stator comprising a channel**, FIG. 9 (63) C. 4 Line 60,** within which the rotor elements of the Gaede pumping mechanism can rotate.

It would have been obvious to one having ordinary skill in the art of vacuum pumps to add a pump of the Gaede type to the pump taught by Stones as modified by Mase, to achieve the desired vacuum levels.

limitations from claim 54, a pump, wherein the rotor element, **FIG. 9 (56) C. 4 Line 54,** of the molecular drag pumping mechanism, **Holweck section, FIG. 9 (55, 56, 57) C. 4 Line 53,** surrounds the rotor elements, **FIG. 9 (61, 62) C. 4 Line 59**, of the Gaede pumping mechanism.

Claims 18-24, 27-28, 39-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stones (EP Patent Application No. 0 959 253 A2) in view of Mase et al (US Patent No. 5,020,969) as applied to claims 1, 3-11, 13-17, 25, 26, 29, 31-38, 42, 45-52, and in further view of Conrad et al (US Patent No. 5,733,104).

Stones and Mase teach and disclose a vacuum pump including a turbomolecular stage, a molecular drag stage and a regenerative stage in combination, of claim 17.

Neither Stones nor Mase teach a second or third inlet, or an additional turbomolecular section, but Conrad does.

Conrad teaches:

limitations from claim 18, a pump, comprising a second pump inlet located between an additional pumping mechanism and a pumping mechanism.

limitations from claim 19, a pump, wherein a second pump inlet is located between an additional pumping mechanism and the molecular drag pumping mechanism.

limitations from claim 20, a pump, wherein a second pump inlet is located between at least part of a molecular drag pumping mechanism and a regenerative pumping mechanism.

With respect to claims 18-20. Fig. 7 of Conrad shows inlets (14, 15’, 16’, 17’) located in different sections of a vacuum pumping unit, FIG. 7 (4). The inlets are located between different pumping sections including turbo-molecular sections, (5c, 5d) C. 6 Line 10, and a Holweck pump, FIG. 7 (6) C. 6 Line 11.

limitations from claim 21, a pump, wherein the second pump inlet**, FIG. 7 (16’)**, connecting to the pump through inlet**, FIG. 8 (9),** is located such that fluid entering the pump there through follows a different path through the molecular drag pumping mechanism than fluid entering the pump through the first-mentioned inlet, **FIG. 7 (14), the fluid from inlet (14) flows into the molecular drag pumping mechanism (Holweck) FIG. 7 (6) at inlet (21) which is at a different point than the second inlet as can be seen in FIG. 8;**

limitations from claim 22, a pump, wherein the second pump inlet is located such that fluid entering the pump there through follows only part of the path through the molecular drag pumping mechanism of fluid entering the pump through the first-mentioned inlet, **FIG. 7 (14), the fluid from inlet (14) flows into the molecular drag pumping mechanism (Holweck) FIG. 7 (6) at inlet (21), which is at a point higher in the path of the flow through the molecular drag pumping mechanism than the second inlet, FIG. 8 (9), as can be seen in FIG. 8;**

limitations from claim 23, a pump, comprising a third pump inlet**, FIG. 7 (15')**, located between the additional pumping mechanism and the molecular drag pumping mechanism, **inlet (15') is located between turbo-molecular section FIG. 7 (5c) and molecular drag pumping mechanism (Holweck) FIG. 7 (6)**;

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time of the invention to combine the inlets taught by Conrad with the vacuum pump taught by Stones as modified by Mase to create a less complicated and less expensive pump, C. 1 Lines 50-65, as well as to allow for the creation of varying levels of vacuum.

limitations from claim 24, a pump, further comprising a turbomolecular pumping mechanism**, FIG. 7 (5c),** upstream from the additional pumping mechanism**, FIG. 7 (5d); It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time of the invention to provide additional levels of vacuum pumps to create a higher level of vacuum;**

limitations from claim 27, a pump, comprising a pump inlet, **FIG. 7 (14),** located upstream from the turbomolecular pumping mechanism**, FIG. 7 (5c) C. 6 Line 10;**

limitations from claim 28, a pump, wherein, in use, the pressure of fluid exhaust from the pump is equal to or greater than 1 mbar; **Wong et al (US Patent No. 5,611,660) is proffered for evidence only. It is common in the art of vacuum pumps to provide an exhaust pressure of more than 1mbar in providing the necessary vacuum. C. 1 Lines 23-25;**

Stones and Mase and Conrad teach and disclose a vacuum pump including a turbomolecular stage, a molecular drag stage and a regenerative stage in combination as in claims 18-24, 27.

Stones further teaches:

limitations from claim 39, an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an impeller),** comprising a rotor element, **FIG. 3 (54) C. 3 Lines 25-29,** for a turbomolecular stage;

limitations from claim 40, an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an**

impeller), wherein the rotor element, **FIG. 3 (54) C. 3 Lines 25-29,** of the turbomolecular stage is integral with the impeller, **C. 3 Lines 25-29, it can be seen from FIG. 3 that the elements (54) are integral with impeller (52);**

limitations from claim 41, a pump comprising an impeller, **FIG. 3 (52, 9) C. 3 Lines 24-25 (rotor body (52) and rotor (9) are considered by examiner to comprise an impeller).**

Response to Arguments

Applicant's arguments filed 01/21/2010 have been fully considered but they are not persuasive.

In regards to the applicant's arguments regarding the non-integral nature of the molecular drag rotor elements, the examiner respectfully disagrees. The Stones reference provides teachings of non-integral rotor parts in FIG. 1; see rotor 9 and elements 26-29. In light of the fact that both integral and non-integral rotor-cylinder arrangements were known at the time of the invention, it would have been obvious to one of ordinary skill in the art of vacuum pumps to substitute one assembly method for the other to meet manufacturing requirements.

In regards to the applicant's arguments regarding the Mase reference as it pertains to integral vs. non-integral rotor elements, the examiner respectfully disagrees. The Mase reference (abstract, C. 1 lines 9-29) does discuss forming vacuum pump parts in an integral manner. However, Mase is concerned with the structure of the stator parts, rather than the rotor and blade elements. Regardless, it is not necessary to

modify the modify the Mase reference in a way that would destroy the invention, as Mase is cited to teach an arrangement of the molecular pump rotor with respect to the regenerative pump mechanism, rather than rotor/blade construction.

In regards to the applicant's arguments regarding the size constraints imposed by providing regenerative and drag elements on the same side of a rotor, the examiner respectfully disagrees. If the Stones reference were to incorporate the regenerative and drag elements on a same side of rotor 9, the elements of the drag section would then surround and overlap the regenerative elements rather than the turbomolecular elements (as taught by Mase), the size would not be greatly effected in the vertical direction. In FIG. 5 of applicant's specification, the elements 116, should they be arranged as in the Stones reference, would appear on the upper side of rotor 120 and around blades 109; thus maintaining a similar size in either direction. Furthermore, the examiner believes that nested parts as taught by Mase would serve to increase compactness in the vertical direction of Stones' pump due to the shared horizontal space.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER BOBISH whose telephone number is (571)270-5289. The examiner can normally be reached on Monday through Thursday, 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571)272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Bobish/
Examiner, Art Unit 3746

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

/C. B./
Examiner, Art Unit 3746